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PANI-PTSA and CoFe₂O₄/Co_{0.5}Zn_{0.5}Fe₂O₄ - Nanocomposite absorption materials prepared for EMI shielding in microwave X-band

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The risk of Electromagnetic Interference (EMI) waves is constantly required to materials work as shielding, which are widely used in various high technology applications such as medical, communications, military. Polyaniline (PANI-PTSA) & Ferromagnetic - Cobalt Ferrite {CoFe₂O₄}/Cobalt-Zinc ferrite {Co_{0.5}Zn_{0.5}Fe₂O₄} nanocomposites are one of these materials which are mix together to have found a solution for these problems.

Methodology & Theoretical Orientation: Polyaniline doped Para Toluene Sulfonic Acid (PANI-PTSA) be set up by substance oxidative polymerization of aniline in aqueous medium with ammonium peroxydisulphate as an oxidant. The sol-gel

auto combustion method has been used to synthesis ferrite samples. Nicholson-Ross-Weir (NRW) method was applied to determine the real and imaginary parts of complex relative permittivity ($\epsilon_r' - j\epsilon_r''$) and permeability ($\mu_r' - j\mu_r''$).

Findings: The composite materials showed maximum absorption frequency range reflection loss of CFP was -7.1 dB at 9 GHz and -9.6 dB at 11.2 GHz, while at the same frequency for CZFP was -17.1 dB and -23.7 dB respectively.

Conclusion & Significance: Result indicated that CZFP was the best (> 98% power absorption) than CFP (>50% power absorption).

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